

HCC4071B/72B/75B HCF4071B/72B/75B

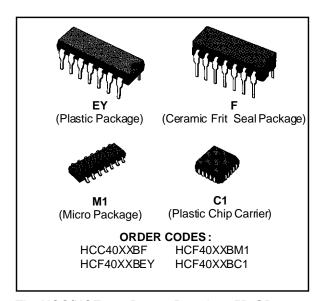
OR GATE

4071B - QUAD 2-INPUT OR GATE 4072B - QUAD 4-INPUT OR GATE 4075B - TRIPLE 3-INPUT OR GATE

- MEDIUM-SPEED OPERATION t_{PLH}, t_{PHL} = 60ns. (typ.) AT V_{DD} = 10V
- QUIESCENT CURRENT SPECIFIED TO 20V FOR HCC DEVICE
- 5V, 10V AND 15V PARAMETRIC RATINGS
- INPUT CURRENT OF 100nA AT 18V AND 25°C FOR HCC DEVICE
- 100% TESTED FOR QUIESCENT CURRENT
- MEETS ALL REQUIREMENTS OF JEDEC TEN-TATIVE STANDARD N°. 13A, "STANDARD SPECIFICATIONS FOR DESCRIPTION OF "B" SERIES CMOS DEVICES"

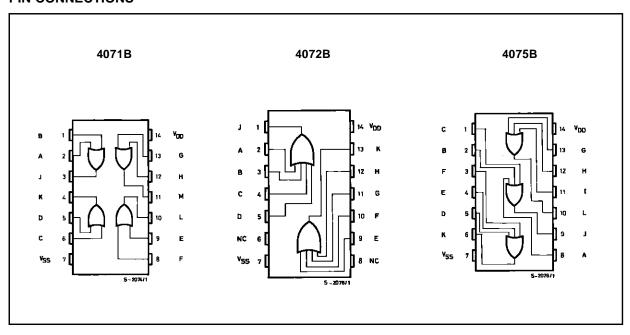
DESCRIPTION

The HCC4071B/4072B and 4075B (extended temperature range) and HCF4071B/4072B and 4075B (intermediate temperature range) are monolithic integrated circuits, available in 14-lead dual in-line plastic or ceramic package and plastic micropackage.



The **HCC/HCF4071B**, **4072B** and **4075B** OR gates provide the system designer with direct implementation of the positive-logic OR function and supplement the existing family of COS/MOS gates.

PIN CONNECTIONS



June 1989 1/11

ABSOLUTE MAXIMUM RATINGS

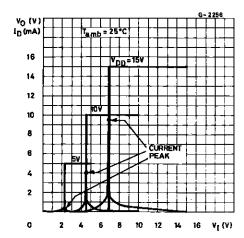
Symbol	Parameter	Value	Unit
V _{DD} *	Supply Voltage : HCC Types HCF Types	- 0.5 to + 20 - 0.5 to + 18	V V
Vi	Input Voltage	- 0.5 to V _{DD} + 0.5	V
I_1	DC Input Current (any one input)	± 10	mA
P _{tot}	Total Power Dissipation (per package) Dissipation per Output Transistor for Top = Full Package-temperature Range	200 100	mW mW
Top	Operating Temperature : HCC Types HCF Types	- 55 to + 125 - 40 to + 85	°C
T _{stg}	Storage Temperature	- 65 to + 150	°C

Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for external periods may affect device reliability.

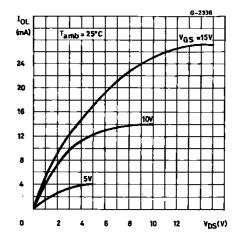
RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{DD}	Supply Voltage: HCC Types	3 to 18	V
	HCF Types	3 to 15	V
V_{I}	Input Voltage	0 to V _{DD}	٧
Top	Operating Temperature : HCC Types	– 55 to + 125	°C
	HCF Types	– 40 to + 85	°C

Typical Voltage and Current Transfer Characteristics.

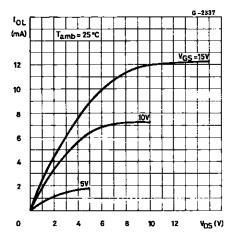


Typical Output Low (sink) Current Characterisitcs.

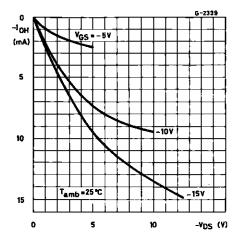


^{*} All voltage values are referred to V_{SS} pin voltage.

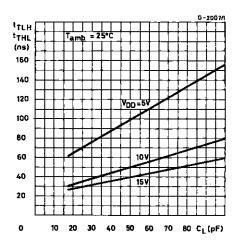
Minimum Output Low (sink) Current Characteristics.



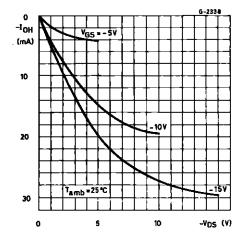
Minimum Output High (source) Current Characterisitcs.



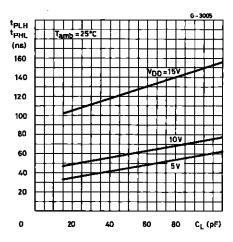
Typical Transition Time vs. Load Capacitance.



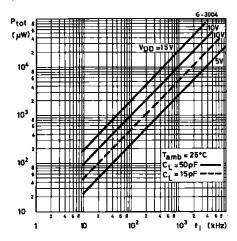
Typical Output High (source) Current Characteristics.



Typical Propagation Delay Time vs. Load Capacitance.

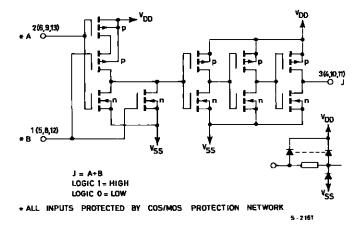


Typical Dynamic Power Dissipation vs. Frequency.

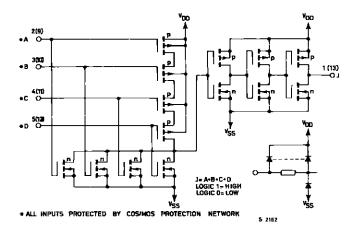


SCHEMATIC DIAGRAMS

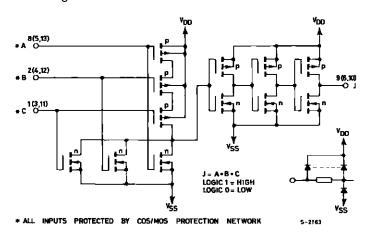
4071B - 1 of 4 identical OR gates



4072B - 1 of 2 identical OR gates



4075B - 1 of 3 identical OR gates



STATIC ELECTRICAL CHARACTERISTICS (over recommended operating conditions)

				est Con	dition	s	Value							
Symbol	nbol Parameter		٧ı	٧o	I ₀	V _{DD}	TL	o w*		25°C		T Hi	gh [*]	Unit
			(V)	(V)	(μA)	(V)	Min.	Max.	Min.	Тур.	Max.	Min.	Max.	
ΙL	Quiescent		0/ 5			5		0.25		0.01	0.25		7.5	
	Current	нсс	0/10			10		0.5		0.01	0.5		15	
		Types	0/15			15		1		0.01	1		30	
			0/20			20		5		0.02	5		150	μΑ
			0/ 5			5		1		0.01	1		7.5	
		HCF Types	0/10			10		2		0.01	2		15	
		Types	0/15			15		4		0.01	4		30	
V _{OH}	Output Higl	h	0/ 5		< 1	5	4.95		4.95			4.95		
	Voltage		0/10		< 1	10	9.95		9.95			9.95		V
			0/15		< 1	15	14.95		14.95			14.95		
V _{OL}	Output Low	ı	5/0		< 1	5		0.05			0.05		0.05	
	Voltage		10/0		< 1	10		0.05			0.05		0.05	V
			15/0		< 1	15		0.05			0.05		0.05	
ViH	Input High			0.5/4.5	< 1	5	3.5		3.5			3.5		V
	Voltage			1/9	< 1	10	7		7			7		
				1.5/13.5	< 1	15	11		11			11		
V _{IL}	Input Low			4.5/0.5	< 1	5		1.5			1.5		1.5	
	Voltage			9/1	< 1	10		3			3		3	V
				13.5/1.5	< 1	15		4			4		4	
I _{OH}	Output		0/ 5	2.5		5	- 2		- 1.6	- 3.2		- 1.15		
	Drive	нсс	0/ 5	4.6		5	- 0.64		- 0.51	- 1		- 0.36		
	Current	Types	0/10	9.5		10	- 1.6		- 1.3	- 2.6		- 0.9		
			0/15	13.5		15	- 4.2		- 3.4	- 6.8		- 2.4		A
			0/ 5	2.5		5	- 1.53		- 1.36	- 3.2		- 1.1		mA
		HCF	0/ 5	4.6		5	- 0.52		- 0.44	- 1		- 0.36		
		Types	0/10	9.5		10	- 1.3		- 1.1	- 2.6		- 0.9		
			0/15	13.5		15	- 3.6		- 3.0	- 6.8		- 2.4		
I _{OL}	Output		0/ 5	0.4		5	0.64		0.51	1		0.36		
	Sink	HCC Types	0/10	0.5		10	1.6		1.3	2.6		0.9		
	Current	Types	0/15	1.5		15	4.2		3.4	6.8		2.4		A
			0/ 5	0.4		5	0.52		0.44	1		0.36		mA
		HCF Types	0/10	0.5		10	1.3		1.1	2.6		0.9		
		Types	0/15	1.5		15	3.6		3.0	6.8		2.4		
I _{IH} , I _{IL}	Input HCC Leakage Types		0/18	Any In	nut	18		± 0.1		±10 ⁻⁵	± 0.1		± 1	μА
	Current HCF Types	0/15	7 WIY III		15		± 0.3		±10 ⁻⁵	± 0.3		± 1	μ	
Cı	Input Capa	citance		Any In	put					5	7.5			pF

 $T_{\text{Low}} = -55^{\circ}\text{C} \text{ for } \text{HCC device } : -40^{\circ}\text{C for } \text{HCF device}.$ $T_{\text{High}} = +125^{\circ}\text{C for } \text{HCC device } : +85^{\circ}\text{C for } \text{HCF device}.$ $\text{The Noise Margin for both "1" and "0" level is : 1V min. with $V_{DD} = 5V$, 2V min. with $V_{DD} = 10V$, 2.5 V min. with $V_{DD} = 15V$.}$

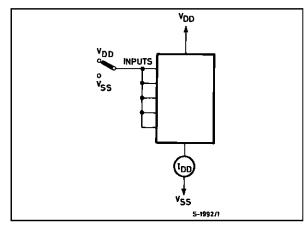


DYNAMIC ELECTRICAL CHARACTERISTICS (T $_{amb}$ = $25^{\circ}C$, C_{L} = 50pF, R_{L} = $200k\Omega,$ typical temperature coefficient for all V $_{DD}$ = $0.3\%/^{\circ}C$ values , all input rise and fall time = 20ns)

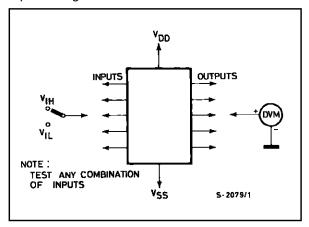
Cumbal	Parameter	Test Conditions	Test Conditions Value				
Symbol	Farameter		V _{DD} (V)	Min.	Тур.	Max.	Unit
tpHL	Propagation Delay Time		5		125	250	
			10		60	120	ns
			15		45	90	
t _{PLH}	Propagation Delay Time		5		175	350	
			70		50	140	ns
			15		50	140	
t_{THL}, t_{TLH}	Transition Time		5		100	200	
			10		50	100	ns
			15		40	80	

TEST CIRCUITS

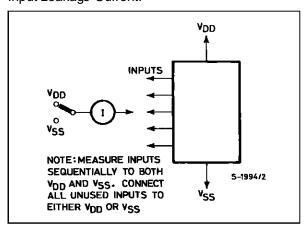
Quiescent Device Current.



Input Voltage.

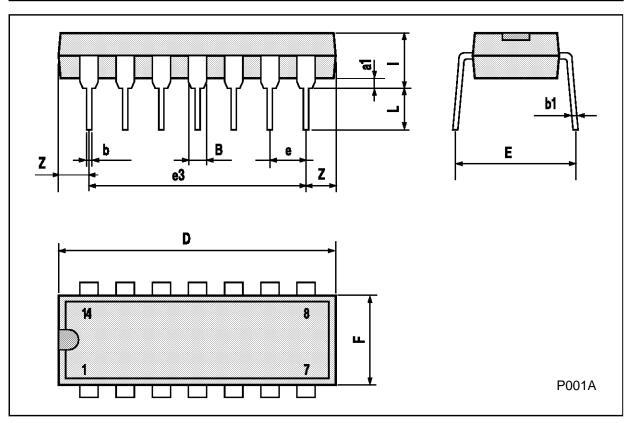


Input Leakage Current.



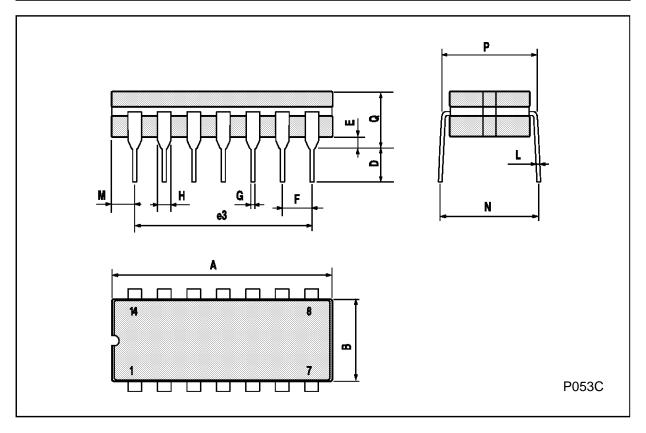
Plastic DIP14 MECHANICAL DATA

DIM.		mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
a1	0.51			0.020			
В	1.39		1.65	0.055		0.065	
b		0.5			0.020		
b1		0.25			0.010		
D			20			0.787	
E		8.5			0.335		
е		2.54			0.100		
e3		15.24			0.600		
F			7.1			0.280	
I			5.1			0.201	
L		3.3			0.130		
Z	1.27		2.54	0.050		0.100	



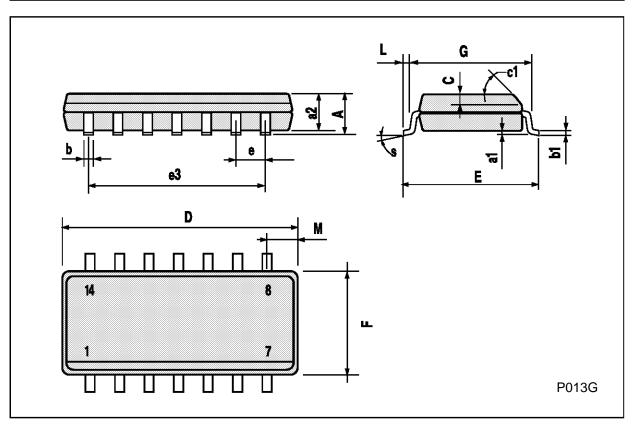
Ceramic DIP14/1 MECHANICAL DATA

DIM.		mm			inch	
Diiii	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
А			20			0.787
В			7.0			0.276
D		3.3			0.130	
Е	0.38			0.015		
e3		15.24			0.600	
F	2.29		2.79	0.090		0.110
G	0.4		0.55	0.016		0.022
H	1.17		1.52	0.046		0.060
L	0.22		0.31	0.009		0.012
М	1.52		2.54	0.060		0.100
N			10.3			0.406
Р	7.8		8.05	0.307		0.317
Q			5.08			0.200



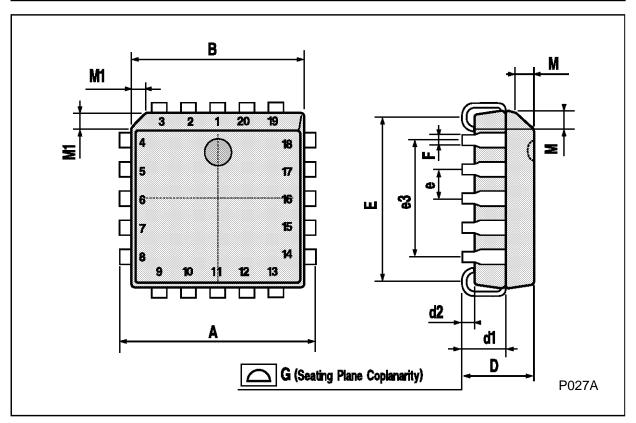
SO14 MECHANICAL DATA

DIM.		mm			inch	
DIIVI.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
А			1.75			0.068
a1	0.1		0.2	0.003		0.007
a2			1.65			0.064
b	0.35		0.46	0.013		0.018
b1	0.19		0.25	0.007		0.010
С		0.5			0.019	
c1			45°	(typ.)		
D	8.55		8.75	0.336		0.344
E	5.8		6.2	0.228		0.244
е		1.27			0.050	
e3		7.62			0.300	
F	3.8		4.0	0.149		0.157
G	4.6		5.3	0.181		0.208
L	0.5		1.27	0.019		0.050
М			0.68			0.026
S			8° (r	max.)		



PLCC20 MECHANICAL DATA

DIM.		mm		inch		
Dim.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
А	9.78		10.03	0.385		0.395
В	8.89		9.04	0.350		0.356
D	4.2		4.57	0.165		0.180
d1		2.54			0.100	
d2		0.56			0.022	
E	7.37		8.38	0.290		0.330
е		1.27			0.050	
e3		5.08			0.200	
F		0.38			0.015	
G			0.101			0.004
М		1.27			0.050	
M1		1.14			0.045	



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